

REMARKS

Reexamination and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.112, and in light of the remarks which follow, are respectfully requested.

The various issues raised in the May 27, 1998 Official Action are discussed in the order in which they appear in the Official Action.

The §112 Rejection

Claims 1-21 stand rejected under 35 U.S.C. §112, second paragraph for the reasons set forth on page 2 of the Official Action. Although the rejection is respectfully traversed on the basis that it is clear from the specification what is meant by “cocatalytically effective amount” and/or the specific recitation of a range for the “effective amount”, Claim 1 has been amended to recite that the amount is effective for conversion of CS₂. Accordingly, withdrawal of this ground of rejection is respectfully requested.

The §102 Rejection

Claims 1-5 and 13-15 were rejected under 35 U.S.C. §102(b) as allegedly being anticipated by Goodboy. This rejection is respectfully traversed for the following reasons.

Legal Standard of §102 Rejection

In order to establish anticipation under §102(b), all elements of the claim must be found in a single reference. Hybritech, Inc. v. Monoclonal Antibodies, Inc., 231 USPQ 81, 90 (Fed. Cir. 1986), cert. denied, 107 S. Ct. 1606 (1987). In particular, as pointed out

by the court in W.L. Gore & Assoc., Inc. v. Garlock, Inc., 220 USPQ 303, 313 (Fed. Cir. 1981), cert. denied, 469 U.S. 851 (1984), "anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference." In the present case, Goodboy clearly fails to anticipate or render obvious the claimed subject matter.

The Invention

The invention relates to novel catalysts for the purification/treatment of gases, especially of gaseous industrial effluents containing sulfur compounds, particularly to recover elemental sulfur therefrom, and more especially to novel catalysts for the Claus reaction and/or the hydrolysis of organic sulfur compounds (specification at page 1, lines 5-11). It has unexpectedly been determined that the extent of the sodium content of alumina is a primary factor in the deactivation thereof, especially by sulphate formation (specification at page 3, lines 11-14). According to the invention, a catalytically active alumina comprises sodium values wherein the sodium content of the alumina ranges from 1,200 to 2,500 ppm of Na₂O by weight thereof (specification at page 3, lines 19-26).

The figure of the drawing is a graph plotting the conversion of CS₂ as a function of the Na₂O content in various alumina catalysts (specification at page 4, lines 2-4). In Example 2, catalysts having various Na₂O contents were prepared and the catalytic activity thereof was tested by contacting the catalysts with a gas having the composition set forth in the table on page 9 of the specification. As shown in the figure, the conversion of CS₂ was unexpectedly improved when the Na₂O range was limited to 1,200 to 2,500 ppm.

Deficiencies of Goodboy

Goodboy discloses a Claus catalyst in the form of activated alumina in which the sodium oxide concentration is stated to broadly range from 0.1 to 2.5 wt% (1000 to 25000 ppm) but with 0.50 to 2.5 wt% (5000 to 25000 ppm) being preferred (column 3, lines 54-60 of Goodboy). In fact, Goodboy discloses that Bayer trihydrates containing high amounts of Na₂O, e.g. 0.4 wt% (4000 ppm) Na₂O are particularly advantageous "because the relatively high Na₂O content required in the catalyst of the [Goodboy] invention can be easily achieved" (Goodboy at column 5, lines 13-40). Example 1 of Goodboy includes 1 wt% (10,000 ppm) Na₂O and the examples in Table 1 of Goodboy include various Na₂O contents, all of which fall outside of the claimed range. As such, Goodboy fails to teach each and every limitation recited in Claim 1. See Hybritech, supra, and Gore, supra.

In order to produce the claimed Na₂O range it is necessary to select a narrow and nonpreferred portion of Goodboy's broadly disclosed Na₂O range. To the extent Goodboy discloses overlapping Na₂O, the rejection should be under 35 U.S.C. §103 rather than §102. However, because Goodboy clearly fails to anticipate the claimed invention, the §102 rejection should be withdrawn.

The §103 Rejection

Claims 1-21 were rejected under 35 U.S.C. §103 as allegedly being unpatentable over Goodboy in view of U.S. Patent No. 5,244,648 ("Dupin") or U.S. Patent No. 3,856,708 ("Carithers"). This rejection is respectfully traversed for the following reasons.

Legal Standard For Overcoming §103 Rejections

In In re Baird, 29 USPQ 2d 1550 (Fed. Cir. 1994), the court stated that "[t]he fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious." Also, evidence of unexpectedly good results can overcome a rejection based on optimization of a "result effective variable" provided the unexpected results are established by factual evidence. In re DeBlauwe, 222 USPQ 191, at 196 (Fed. Cir. 1994). With respect to optimization, in In re Antonie, 195 USPQ 6, 8 (CCPA 1977), the court stated that:

The PTO and the minority appear to argue that it will always be obvious for one of ordinary skill in the art to try varying every parameter of a system in order to optimize the effectiveness of the system even if there is no evidence in the record that the prior art recognized that particular parameter effected the result. As we have said many times, obvious to try is not the standard of 35 U.S.C. §103. (Emphasis in original.) Antonie, at 8.

The court in Antonie also stated that while the discovery of an optimum of a variable in a known process is normally obvious, there are two exceptions to the rule. The first exception is when the results of optimizing a variable, which was known to be result effective, were unexpectedly good. The second exception is in the case where the parameter optimized was not recognized to be a result-effective variable. In the present case, Goodboy provides no recognition that the Na₂O content would be effective in providing improved CS₂ conversion rates. The Nedež Declaration submitted with the Amendment filed May 28, 1998 shows that the claimed Na₂O range produces unexpected improvement in CS₂ conversion in comparison to the closest examples of Goodboy.

Further, Goodboy's preference for Na₂O contents in amounts of 0.5% and above teaches away from the claimed invention. Such high contents fall on the flat portion of the curve in the Figure of the present application, leading the skilled artisan to expect no benefit in CS₂ conversion at lower Na₂O contents.

Showing of Unexpected Results

The Nedez Declaration includes Attachment I wherein CS₂ conversion is plotted with respect to various Na₂O contents in a gas-catalyst prepared according to the process set forth in paragraph 2 of the Nedez Declaration. Attachment I shows the corresponding CS₂ conversion rate for the closest Na₂O examples of Goodboy compared to the claimed 1,200 to 2,500 ppm Na₂O range (see paragraph 7 of the Nedez Declaration). As explained above, Goodboy fails to disclose any examples falling within the claimed range for the Na₂O content. Attachment I shows that the claimed 1,200 to 2,500 ppm Na₂O content provides new and unexpected results with respect to CS₂ conversion.

Attachment I also shows interpolated data based on the Na₂O contents of Goodboy's Examples 6, 8 and 9 wherein the Na₂O contents are 0.09 wt% (900 ppm), 0.1 wt% (1,000 ppm) and 0.33 wt% (3,300 ppm), respectively. As set forth in paragraph 7 of the Nedez Declaration, by interpolation using the above graph, the *Goodboy* Example 6, 8 and 9 catalysts would exhibit CS₂ conversions of 47.5, 48.1 and 38.9%, respectively (assuming that they are identical in every way to the catalyst described in paragraph 3 above, except for Na₂O content). In view of the showing of unexpected results in the Nedez Declaration, it is submitted that any prima facie case of obviousness based on Goodboy has been

rebutted. As the secondary references (Dupin and Carithers) are only relied on for features other than the Na₂O content, no further discussion thereof is deemed necessary.

Conclusion

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited.

Respectfully submitted,

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Date: September 28, 1998